

## *Mars: A planet with a heart?*



PIA01342

A message of love appears to be among the latest images from Mars Global Surveyor. This heart-shaped formation is actually a pit formed by collapse within a straight-walled trough known in geological terms as a graben. Graben are formed along fault lines by expansion of the bedrock terrain. This and other Mars Global Surveyor images are available online at <http://photojournal.jpl.nasa.gov>.

## Asteroid hunters get a NEAT source of help

*Search for near-Earth objects made easier with electronic camera*

By JANE PLATT

JPL astronomers searching for asteroids headed toward Earth are expanding their sky-watching repertoire by adding high-tech, computerized electronic upgrades to the classic 1.2-meter-diameter (48-inch) Oschin telescope atop

Palomar Mountain near San Diego.

Right now, the Near Earth Asteroid Tracking (NEAT) system uses a fully automated charge-coupled device (CCD) camera mounted on a 1-meter-diameter (39-inch) telescope atop Mt. Haleakela on Maui, Hawaii. The U.S. Air Force

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## QuikScat's orbit is refined

*Vandenberg launch goes smoothly*

By DIANE AINSWORTH

Circling the Earth every 97 minutes, NASA's new QuikScat ocean-viewing satellite is in the thick of a series of cluster burns that will bring the spacecraft into a uniform, 800-kilometer (500-mile) mapping orbit for the start of the primary mission on July 19.

"The spacecraft is extremely well behaved and the engineering and science teams are performing exceptionally well," said Jim Graf, QuikScat project manager at JPL. "In addition to that good fortune, the telemetry we're receiving actually looks better than the simulations. We're ecstatic with the satellite's performance so far."

The QuikScat spacecraft with the SeaWinds instrument onboard will measure ocean surface winds, providing both speed and direction for use in oceanographic research, weather forecasting and storm monitoring.

Launched at 7:15 p.m. Pacific Daylight Time on June 19 from California's Vandenberg Air Force Base, QuikScat completed the first of five planned cluster burns on June 24 to raise the perigee, or closest point to Earth, from an initial staging altitude of about 290 kilometers (180 miles) to about 420 kilometers (260 miles).

Five 10-minute burns using the spacecraft's 4.4-Newton thrusters were performed beginning at 1 p.m. PDT. The thrusters were fired approximately every three hours throughout the day, on every second orbit around Earth. The commands were generated at the University of Colorado's Laboratory for Atmospheric and Space Physics, which conducts spacecraft operations under the direction of engineers from Ball Aerospace &

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# News Briefs

The futuristic ion propulsion system on JPL's Deep Space 1 spacecraft is the winner of Discover magazine's Award for Technological Innovation in the exploration category.

The magazine's annual awards honor teams whose innovations improve the quality of everyday life. Twenty-seven technologies were selected as finalists. Nine winners, featured in Discover's July issue, were announced at a recent ceremony in Florida.

The award went to the Solar Electric Propulsion Technology Application Readiness (NSTAR) program team, which developed and delivered Deep Space 1's ion propulsion system. Accepting on behalf of the team was former NSTAR manager **Jack Stocky** of JPL.

The ion drive combines a gas found in photo flash units with some of the technologies that make television picture tubes work to deliver a thrust only as powerful as the pressure of a sheet of paper resting on

the palm of a hand. The engine can increase a spacecraft's velocity 10 times more than can a conventional liquid or solid fuel rocket.

Deep Space 1, launched last October, has tested 12 new technologies, including ion propulsion, so that they can be confidently used on space missions of the 21st century.

The NSTAR program began in the early 1990s as a partnership between JPL and NASA's Glenn Research Center in Cleveland to develop xenon ion engines for deep-space missions. In June 1996, a prototype engine built by the Glenn center began a long-duration test in a vacuum chamber at JPL simulating the conditions of outer space. The test concluded in September 1997 after the engine successfully logged more than 8,000 hours of operation. □

Aviation Week & Space Technology magazine recently named a number of JPLers to its

Laureates Hall of Fame, which recognizes past winners of its Laurels awards.

Receiving Hall of Fame honors in the "Space" category were **John Casani, Richard Cook, Rob Manning, Dr. Jacob Matijevic, Brian Muirhead, William O'Neil and Dr. Edward Stone**. Retired employee **Anthony Spear** also received the honor. □

The 1999 Annual Briefing for Administrative Secretaries workshop tape and training materials are available for loan to JPL individuals and groups through the Career Library located in Trailer 1703.

**Lynne Pertum**, a member of JPL's Advisory Council for Women (ACW), which is sponsoring the loan of the materials, said a wide range of issues is covered, including broadening skills beyond traditional secretarial roles.

The two-hour tape includes segments on the changing role of administrative professionals, strategies for dealing with change, new technologies and the office of the future, the challenge of becoming a supervisor and tips for project management. □

Security's Locks & Keys office notes its new location and hours. The office is in Building 310-126 and is open Monday, Wednesday and Friday from 9 to 11 a.m. and Tuesday and Thursday from 1 to 3 p.m.

For information, call ext. 4-4935. □

## ISO certification under way

JPL has been officially notified that the formal processing of its ISO 9001 certificate is under way. The notification was the result of the lead auditor's acceptance of JPL's corrective action plans for the non-conformities discovered in the March registration audit. Formal delivery of the actual certificate is estimated to be in July or August.

Auditors from the third-party ISO registrar, DNV Certification, Inc., found 22 non-conformities during the March registration audit, said ISO team manager Dr. Jerry Sutor. The lead auditor's approval of the corrective action plans initiated the processing of

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# Special Events Calendar

## Ongoing

**Alcoholics Anonymous**—Meeting at 11:30 a.m. Mondays, Tuesdays, Thursdays (women only) and Fridays. For more information, call Occupational Health Services at ext. 4-3319.

**Codependents Anonymous**—Meeting at noon every Wednesday. For more information, call Occupational Health Services at ext. 4-3319.

**Gay, Lesbian and Bisexual Support Group**—Meets the first and third Fridays of the month at noon in Building 111-117. For more information, call employee assistance counselor Cynthia Cooper at ext. 4-3680 or Randy Herrera at ext. 3-0664.

**Parent Support Group**—Meets the fourth Tuesday of the month at noon. For location, call Jayne Dutra at ext. 4-6400.

**Senior Caregivers Support Group**—Meets the second and fourth Wednesdays of the month at 6:30 p.m. at the Senior Care Network, 837 S. Fair Oaks Ave.,

Pasadena, conference room #1. For more information, call (626) 397-3110.

## Friday, June 25

**JPL Dance Club**—Meeting at noon in Building 300-217.

**JPL Perl Users Group**—Meeting at noon in Building 301-127.

## Monday, June 28

**"Effective Time Management"**—This ACW-sponsored seminar, presented by psychotherapist Patricia Fitzpatrick, will offer techniques for using time effectively to achieve a more balanced, productive lifestyle. It will describe essential steps to effective time management, procedures for decision making, examples of time wasters, and methods for starting a personal time management program. At noon in von Kármán Auditorium.

## Wednesday, June 30

**JPL Drama Club**—Meeting at

noon in Building 301-127.

## Thursday, July 1

**JPL Gun Club**—Meeting at noon in Building 183-328.

## Friday, July 2

**JPL Dance Club**—Meeting at noon in Building 300-217.

## Tuesday, July 6

**JPL Gamers Club**—Meeting at noon in Building 301-227.

**JPL Genealogy Club**—Meeting at noon in Building 301-169.

## Wednesday, July 7

**AFS Quick-Start Session for Windows NT**—Jeff Sachs of Section 364 will provide an overview of the benefits of using the AFS distributed file system to manage your computer files. Learn how to share files, set up group space, access data, publish web

pages, obtain online help, change your password, create protection groups, protect data, and more. At noon in the Building 167 Conference Room, followed by a Q & A session at 1 p.m.

**Associated Retirees of JPL/ Caltech Board**—Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

**JPL Drama Club**—Meeting at noon in Building 301-127.

## Thursday, July 8

**SESPD Lecture Series**—Joel Sercel of Division 350 will present "The Product Attribute Database (PAD): The Rosetta Stone for Project Engineering, Design and Analysis at JPL" at 11 a.m. in von Kármán Auditorium.

## Friday, July 9

**JPL Dance Club**—Meeting at noon in Building 300-217.

**JPL Perl Users Group**—Meeting at noon in Building 301-127.

# SESPD announces reorganization

JPL has reorganized the Space and Earth Sciences Programs Directorate to include all elements of the Mars Exploration Program and to better focus the Laboratory's program-management responsibilities with NASA Headquarters.

The new structure will enable Laboratory program managers to better align and integrate the development of JPL's projects and meet the requirements of NASA Headquarters sponsors in the Office of Space Science (Code S) and Earth Science (Code Y). The new structure recognizes the key role for managers of the programs assigned to JPL by NASA Headquarters.

Each assigned program area will be represented by an SESPD program manager to interface with NASA Headquarters, as well as offices that address future mission concepts and science, build spacecraft and develop active missions, and conduct mission operations.

SESPD Director Dr. Charles Elachi said the organization's new structure provides that projects' formulation and approval phases be conducted by the following offices: Solar System Exploration Office (710), managed by Doug Stetson; Origins and Fundamental Physics Office (720), managed by Dr. Firouz Naderi; Earth Science Office (730), managed by Alfred Zieger; and Mars Exploration Office (740), led by Dr. Daniel McCleese. A portion of the new Program Technology Office (705), which is led by Dr. Leslie Deutsch, will also support the ini-

tial two phases of projects' life cycle.

A series of new "implementation offices" has been created within SESPD to carry out the development and operations phases of approved projects. These new offices represent Planetary Flight Projects (750), managed by Gary Parker; Astrophysics Flight Projects (760), managed by Larry Simmons; Earth Science Flight Projects (770), managed by Charles Yamarone; Earth Science Flight Experiments (780), managed by Benn Martin; and Space Science & Microgravity Flight Experiments (790), managed by Michael Devirian; the Mars Sample Return Project (706), managed by Bill O'Neil; and the Mars Surveyor Operations Project (707), managed by Richard Cook.

The New Millennium Program Office, led by Dr. Fuk Li, remains intact, as do other existing program offices for Space Infrared Telescope Facility (SIRTF), managed by Simmons, and Origins, led by Naderi. In addition, the Deep Space Systems Office and Mars Surveyor Program Office have been formed, with former Space Interferometry Mission (SIM) Project Manager Chris Jones named manager of both offices. Other new program offices are the Foreign Space Science Office, managed by John Wellman, and the Earth Observing System (EOS)-J/Earth Process (EP)-J Office, managed by Yamarone. The "J" stands for the JPL-managed portion of NASA's EOS/EP missions, some of which are managed

by the Goddard Space Flight Center in Maryland, and are termed EOS-G/EP-G.

In addition, Gail Robinson, who led Mars' Business Operations Office, will manage a similar effort for SESPD. The directorate's Outreach and Education Office, managed by Mark Pine, will also now encompass Mars projects.

Dr. Frank Jordan, who managed Mars program architecture, will now do this for SESPD overall, reporting to Elachi. Dr. Roger Bourque, who formerly handled international partnerships for Mars, will now be on the SESPD technical staff handling international partnerships for SESPD overall, and Nick Thomas will lead institutional partnerships for the directorate.

In addition, Elachi said, the new organization will be aligned with the Develop New Projects (DNP) process and other reengineering efforts. It will all be held together through the Project Leadership Process, where program and project managers are assigned the authority and responsibility to formulate and implement their activities.

For example, to conform with a new NASA project life-cycle procedure, known as NASA Procedures and Guidelines (NPG) 7120.5A, flight-projects development is now structured in formulation, approval, implementation and assessment (review) phases. SESPD offices that oversee the two initial phases of project development will utilize the Mission Systems Design process, while the offices responsible

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## NEAT

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operates the telescope.

NEAT scientists will computerize the pointing system of Palomar's Oschin telescope, which currently uses a human operator exclusively, and replace photographic plates with a modern electronic camera. The refurbished telescope will enable them to peer deeper into the sky than they can from Haleakela—they'll see 20 percent farther, and their field of view will be 10 times wider.

"Imagine watching the Super Bowl on your 25-inch TV and then switching to an 80-inch giant-screen TV," said JPL's Dr. Steven Pravdo, NEAT project manager and co-investigator. "But in this case, it's even better than the TV analogy because, with the wider field, we'll see many more asteroids in each picture—those that would be on the 'sidelines' of other telescopes."

The NEAT-Oschin alliance got a test run on June 9 and 10, when Pravdo and two other JPL astronomers, Dr. David Rabinowitz and Jeffrey Schroeder, took the NEAT camera to the Oschin



Spiral galaxy M64 as taken with the NEAT camera and Palomar 48" telescope in early June.

telescope. They obtained the first-ever electronic images from that venerable sky eye.

"This experiment proved that the Oschin telescope will be a powerful tool in our hunt for near-Earth objects," Pravdo said. "We'll spruce up this gentle giant and put it to excellent use helping us find asteroids."

"For 10 years, I've dreamed

and mapped out plans for adding electronic detectors to this telescope," said JPL's Eleanor Helin, principal investigator for NEAT, which has been operating since December 1995. "We've been able to study only a fraction of the sky so far, and we've been looking for ways to cover the entire sky."

JPL's goal is to find all asteroids larger than 1 kilometer (0.6 mile) across within 10 years. "This will achieve one-third of that goal, with the remaining two-thirds filled by the Haleakela camera and other viewing sites," Helin explained. "The Oschin telescope at Palomar may become the premier finder of near-Earth objects in the world."

It's estimated there are 1,000 to 2,000 asteroids larger than 1 kilometer that approach within 48 million kilometers (30 million miles) of Earth. Less than 20 percent have been detected so far. Although the vast majority are harmless and will never pose a threat to Earth, scientists want to keep track of the tiny percentage whose orbits could eventually put them on a collision course with Earth.

The Oschin telescope, operated by Caltech, has served as a world-

class telescope since it was built in 1949. Helin used the telescope to discover near-Earth asteroids and comets from the late 1970s to the early 1990s. The instrument is currently completing the second of two sky surveys that serve as a resource to astronomers worldwide. The Oschin telescope has done yeoman's duty for astronomers through the years, but it has been surpassed in many ways by newer, more advanced telescopes. Nonetheless, it remains the telescope with the largest field of view.

NASA will fund the Oschin upgrade, estimated to cost \$300,000 to \$500,000, and Caltech will provide the use of the facility and the infrastructure. Within about two years, astrophysicists from Yale University in New Haven, Conn., may provide further high-tech upgrades to maximize the potential of the Palomar telescope.

Images gathered by NEAT using the Oschin telescope, along with general information on NEAT, are available online at <http://neat.jpl.nasa.gov>. Information on the Palomar Observatory is available online at <http://astro.caltech.edu/observatories/palomar/public>. □

# Upward Feedback returns

Upward Feedback, a survey tool used at JPL to measure employees' input about management effectiveness, is returning for a second round.

First employed in 1996 following an employee survey indicating that managers needed to develop better interpersonal and leadership skills and stay in touch with the needs of workgroups, Upward Feedback is now in the first of its three sessions this summer.

Participation in this second round of Upward Feedback is voluntary for supervisors, who can still sign up for the current session as late as June 28, and as late as July 12 for the third session.

The sessions take place over a five-week period and include an anonymous online survey for workgroup members, a one-on-one coaching session between a manager and a facilitator, and a facilitated workgroup discussion.

The workgroup discussions generate specific action plans, which the manager reviews with his or her boss. Managers and workgroup members will periodically assess the action plans and their effectiveness.

Upward Feedback survey questions are the same as those used in the first round, with the addition of a few new ones. They include questions that assess managers' behavior in eight categories: basic communication, direction and feedback, empowerment, investment in people, resource management, teaming, performance focus, and leadership.

Second-round data will identify themes consistent with the first round, which was completed in February 1998. "We are looking forward to comparing data from rounds 1 and 2, which will be critical in validating needed areas of improvement," said Rick Hann of the Human Resources Directorate.

In the initial round, employees found the most highly rated manager strengths to be "practices trustworthiness and integrity" (88 percent responding favorably) and "lets me do my job without interfering" (87 percent). Areas cited as needing the most improvement were "gives me appropriate career guidance" and "gives me clear, effective and timely feedback on my performance, with 45 percent and 54 percent favorable responses, respectively.

Upward Feedback results are considered to be effective if 80 percent of members in a workgroup agree or strongly agree that the desired behavior is practiced by their manager.

"Upward Feedback is a process in which employees provide concrete actions to make things better," Hann said. "Employee participation is the key. People should take advantage of this opportunity to think about how their workgroup is managed and provide constructive suggestions to improve the things that are most

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**Astronaut Willie McCool, left, and astronaut candidate Leland Melvin, right, join STS-96 JPL Space Flight Awareness honorees. From left are Michael Norwood, Section 665; John Reimer, Section 311; Cecil Brower, Section 660; Deborah Drake, Section 507; Dwight Durkee, Section 940; and Yvonne Samuel, Section 180.**

## *Space Flight Awareness honorees feted*

Six JPL employees joined approximately 250 others from NASA centers, contractor companies and the U.S. Air Force in receiving NASA's Space Flight Awareness (SFA) launch honoree award last month, the highest tribute paid by NASA to government and industry workers.

Honorees were given a VIP tour of the Kennedy Space Center, attended a reception in their honor with approximately 20 astronauts, and viewed the dawn launch of STS-

96 on May 27.

The honorees were presented their awards by JPL distinguished guests Joe Charles, manager of Section 665; Ron Ploszaj, deputy director of the Engineering and Science Directorate; astronaut Willie McCool and astronaut candidate Leland Melvin.

For information about the JPL SFA program and STS-96 mission, go online to <http://epic/sec614/reward/sfa.htm>. □

## *Passings*

**Lane Prior**, 89, a retired safety engineer in Section 611, died of cardiac arrest and respiratory illness May 9 at a nursing home.

Prior joined JPL in 1962 and retired in 1977. He is survived by his son William.

Services were held at Rose Hills Memorial Park in Whittier.

**Robert Topping**, 89, a retired administrative aide in Section 664, died of heart failure May 14 at his Monrovia home.

Topping worked at JPL from 1949-77. He is survived by his wife, Ruth.

Services were held at Live Oak Cemetery in Monrovia. □

**Dorothy Johann**, 82, a retired senior department clerk in Section 356, died of an aneurysm May 28.

Johann joined JPL in 1966 and retired in 1979. She is survived by her husband, William; one son, two grandchildren and two great grandchildren. Services were private. □

**Marshall Humphrey**, 77, a retired senior engineer in Section 350, died of a heart attack June 12.

Humphrey worked at the Lab from 1968-90. He is survived by daughters Mindy Ann Humphrey, Pamela Humphrey-Zugor, Wendy Humphrey and Sherry Grant.

Services were held at Fort Rosecrans National Cemetery in San Diego. □

“**The major issue is work, pure and simple. Where is [it] coming from? How does it get here, and who is responsible for making decisions about what kinds of work is accepted? How can we get it all done, retain our sanity and maintain lives of our own?**”

”**People need some light at the end of the tunnel. If people saw that the changes going on were taking root, I think the entire feeling of the place would be different. . . . Once things kick in, I think there will be a huge sigh of relief.**”

# An independent source for help

By MARK WHALEN

Lewis Redding is JPL's ombudsman, the first person to serve in such a role in the Laboratory's history. Since August 1996 Redding has served as a neutral party to help seek solutions to a wide variety of employee concerns. His role is to be an independent, objective, confidential, non-management voice to which employees can turn for help. Redding formerly held the same job at the Massachusetts Institute of Technology's Lincoln Laboratory, and prior to joining JPL held the position of ombudsman at Northeastern University in Boston.

In one of an ongoing series of articles about change at JPL, Redding shares his observations about his job and JPL.

**Question:** *How do you get to be an ombud? What kinds of skills are required?*

**Answer:** Anything that has elements of mediation, negotiation, etc. could be a very decent background for the job, as would counseling. A lot of people think ombuds are psychologists, but we are not—that's not part of the role. Most organizations hire [the position] internally. They look for someone who is winding down his or her career, who has a reputation for lots of honesty and integrity, and who doesn't have a lot of internal baggage. Organizations may ask this type of person to become an ombud because they know the organization and the culture, and that's a huge advantage. On the other hand, by hiring from outside the organization, the advantage is that the person coming in doesn't have any baggage.

*Has it been an advantage or disadvantage for you to come to JPL from the outside?*

I think it's made sense for me to come here from the outside. I would probably be less likely to say that had I not also worked for Lincoln Laboratory. If I had come here out of say, banking, I think the culture would have really presented a problem for me. I was aware of JPL and what it did, and it was fascinating to me. Lincoln Laboratory is a federally funded research and development center, as is JPL, so I thought there was compatibility in terms of what the place might be like.

*Are you an advocate for the employees?*



PHOTO BY SCOTT CHAVEZ

Lewis Redding

Advocacy is not appropriate for an ombud, generally speaking. Occasionally, advocacy will fall out of an issue, but an ombud is not in a position to advocate either for an employee or for the company. Usually, the position's only advocacy should be for fair process. In terms of issues that come to us, we're supposed to remain neutral and impartial.

*Why did JPL create the position of ombudsman?*

My understanding was that the decision to hire an ombuds was management's response to employees' concerns. Employees had expressed concerns that there was no place they could go on Lab that was neutral.

*In the three years you've been at JPL, have you noticed changes in what issues and areas of concern are most important to employees?*

There's often an ebb and flow to how and when issues come forward. When I first got here, the biggest concerns were outsourcing/downsizing and the new compensation plan. But employee issues generally revolve around

perceived conflict with someone else, usually with an individual—sometimes with a supervisor. People might say they have been treated unfairly, for one reason or another, and want to know what they can do about it.

*What do you tell a person who comes to you for advice about a conflict?*

I normally tell employees who have an issue or concern that they ask the person they trust and respect most to provide assistance. So it may not be me. But I also ask employees, "Would you be comfortable talking to or have you talked to your supervisor about this issue? If you haven't or don't feel comfortable with that, why not?" An employee simply may not know the best way to approach the supervisor for a discussion. It could be, say, "Should I have a formal meeting, or should I try catching them when they're getting coffee?" If the employee finally decides that he or she can't talk to their supervisor about the issue, I will ask the employee if it makes sense for me to talk to their supervisor about it. We will then talk about the pros and cons about anything that gets done.

*What other concerns do you see expressed?*

Right now, and I think it's been true for about a year and a half now, the major issue is work, pure and simple. Where is [the work] coming from? How does it get here, and who is responsible for making decisions about what kinds of work is accepted? How can we get it all done? How can we get it all done, retain our sanity and maintain lives of our own?

*Hasn't JPL always functioned with this kind of stress?*

Yes. For many people working on smaller and multiple projects, and switching hats often, it is difficult. I think the scariest thing for the Laboratory is the possibility of mission failure. Those kinds of issues add a peculiar kind of stress. And I think people here are very much afraid of appearing to be whiners, complainers, or give an impression that they can't do the job. This makes it very difficult for people to come forward and say, "I need a day off." No one wants to appear to be shirking their tasks and responsibilities and no one wants to be seen as

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## QuikScat

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Technologies Corp., builders of the spacecraft, and were sent to JPL's Deep Space Network station 46 in Canberra, Australia.

The first cluster burn increased the spacecraft's velocity to about 44 meters per second (100 mph), said David Farless, QuikScat mission design engineer, and adjusted its speed to about 7.4 kilometers per second (16,500 mph). Subsequent burns will continue to adjust QuikScat's orbit until the spacecraft is circling Earth at a constant altitude of 803 kilometers (500 miles).

"Later burns will refine the spacecraft's orbit, requiring progressively smaller amounts of propellant as tank pressure declines and thruster performance decreases," Farless said. "The cluster burns are tentatively scheduled for about the same time of day on June 27, June 29, July 1 and July 3. Once we've circularized the orbit, we will perform an additional two or three very small burns to precisely adjust the final orbit size, shape and orientation."

The SeaWinds scatterometer will be turned on July 7, when it will begin calibration testing, according to Kent Kellogg, SeaWinds instrument manager at JPL. Members of the science team will spend about 40 days calibrating initial data before disseminating it to the entire science team.

Launch of the spacecraft aboard an U.S. Air Force Titan II rocket from Vandenberg's Space Launch Complex 4 West occurred after a seven-month delay due to a series of launch vehicle mishaps. Hidden by heavy fog over the coast of central California, the 970-kilogram (2,140-pound) satellite lifted off the launch pad at the opening of a 10-minute window and tore through the sky in a south-southwesterly direction. Approximately 3½ minutes into flight, the Titan nose cone separated in three parts and was jettisoned, unveiling the QuikScat spacecraft. About two minutes later, after second-stage engine shut-down, the Titan rocket turned to reorient itself and shield QuikScat from sunlight.

The Titan launch vehicle's second stage and QuikScat spacecraft coasted over the Southern Hemisphere for 48 minutes, crossing Antarctica and heading in a north-northwesterly direction toward Africa. Over Madagascar, when the Titan reached maximum altitude, the vehicle turned to



BOB BROWN / JPL PHOTO LAB

**JPL staff enjoy a free lunch and a spot of shade June 22 in celebration of the June 19 launch of QuikScat, culminating the Laboratory's six spacecraft launches over the last nine months. Starting last Oct. 24, JPL also launched Deep Space 1, Mars Climate Orbiter, Mars Polar Lander, Stardust and the Wide-Field Infrared Explorer.**

adjust its orbit and fired the residual propellant in the attitude control system to raise the perigee.

Just off the coast of Mozambique, about 59 minutes after launch, QuikScat separated from the Titan II's second stage booster and was pushed into a looping orbit over Earth's poles that took it as close as 279 kilometers (173 miles) from Earth's surface and as far away as 807 kilometers

(501 miles). At 8:15 p.m. PDT, the spacecraft's solar panels, which provide 642 watts of power, opened to their full 3.8-meter (11-foot) wingspan. One of the QuikScat tracking stations at Svalbard, Norway, acquired the spacecraft's first signal at 8:32 p.m. PDT, about one hour and 18 minutes after launch. A second tracking station at Poker Flats, Alaska, confirmed the spacecraft signal at 8:43 p.m. PDT.

Once the spacecraft has completed the cluster burns, the SeaWinds scatterometer will begin collecting data from 90 percent of the Earth's surface each day. Although calibration and validation of the measurements by the science team will continue for several months, QuikScat will formally begin its two-year primary mission of mapping ocean wind speed and direction on July 19.

QuikScat is part of NASA's Earth Sciences Enterprise, a long-term research and technology program to examine Earth's land, oceans, atmosphere, ice and life as a total integrated system. JPL built the scatterometer and has provided ground science processing systems. NASA's Goddard Space Flight Center in Maryland managed development of the satellite. □

## ISO

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the DNV Registration Certificate. The JPL corrective action plans adequately addressed the auditor's concerns, Suitor said, and reassured them that any unresolved issues are being given the attention they require.

Corrective actions are currently being completed by assigned individuals who are working the remaining details. A full list of all findings is posted on the ISO web site at <http://iso>.

"I have reviewed the corrective action plans to the non-conformity notices from the initial audit and find them all to be satisfactory responses," said Tom Dadson, DNV's senior lead auditor, in a message to Suitor. "We will follow up on their effectiveness at the first periodical audit. The recommendation process is proceeding."

"Employees worked hard prior to the audit, identifying work processes and organizing documents to be sure all was in good

order for the auditors," Suitor said. "Everyone had a role to play as notebooks were assembled and the JPL Quality Policy memorized. In the words of Laboratory Director Dr. Ed Stone, 'the involvement of every single person on Lab was a major part of the success we had.'"

A presentation on the current status of JPL's ISO program in von Kármán Auditorium Friday, June 25 at noon. Suitor will discuss JPL's responses to the April findings, the next round of internal assessments, and the upcoming September DNV surveillance audit.

All NASA centers are mandated to meet ISO standards by the fall of 1999. The standards are customer-focused and were adopted by the Lab as a best business practice, Suitor said. The auditors return every six months for periodic audits, the next one being scheduled for September 1999.

"In preparation for the September audit, internal assessments will be held the week of July 12, so hang on to your ISO notebook because you will be needing it again," Suitor said. □

## Retirees

The following employees retired in June:

**William Frey**, 40 years, Section 834; **Lawrence Lim**, 35 years, Section 174; **George Lutes**, 35 years, Section 335; **Fred Shair**, 32 years, Section 109; **David Lane**, 30 years, Section 310; **James McDanell**, 29 years, Section 312; **Roger Hoon**, 26 years, Section 223; **Marguerite Gaudet**, 21 years, Section 661; **James Kesterson**, 21 years, Section 390; **James Bradley**, 20 years, Section 385; **Riley Strickland**, 19 years, Section 333; **Carole Bradley**, 16 years, Section 623; **Stephen Huffman**, 13 years, Section 760. □

## Ombuds

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a failure. I think people need some light at the end of the tunnel. If people saw that the changes going on were taking root, I think the entire feeling of the place would be different. Once things kick in and start to make things better, I think there will be a huge sigh of relief. There will also be a sigh of relief because we are close to meeting the downsizing and outsourcing goals, which may bring a bit of a respite.

*But is JPL that different from other work environments? Isn't all of NASA working under "faster, better, cheaper?"*

One of the unique things about JPL is that a good number of people here haven't worked anywhere else. Some people tend to have a somewhat insulated view about JPL, and they may automatically make an assumption that JPL is worse on a given issue than a company in the outside world might be. And it's not true. For some people, there's no accurate way to compare JPL to the outside world. JPL is not a perfect organization, but it's far superior to a heck of a lot of organizations in the outside world. I tend to think a lot of employees may be harder on JPL than JPL deserves simply because so many employees don't have an outside measure.

*What other challenges do you see for the Lab from your perspective?*

The Laboratory gets the technical stuff done. We do meet those challenges. But my perception is that the difficult things for the Laboratory are the people things. JPL talks about teaming, partnering, information sharing—things that are perhaps more people-intensive than they used to be, and we've got to get better at that.

We're doing things that no one else is supposed to be able to do—all of that says the way we relate to each other in the workplace becomes more and more important. We ignore that at our peril. I don't think we ignore that now, but we must get better at it.

*So how do we address getting people to better work together?*

Solutions are not necessarily easy to come by. Solutions take everybody. It would be curious to me if there were a way where employees were involved in some of the solutions—at least in providing ideas to find solutions for some of the work-issue problems. Clearly, employees can't determine what work comes in here. But maybe there's a way for employees to have input into rescheduling work, or how people get work done. It seems to me that as many minds as we can get to working on some of this stuff, the better. A good example of this is the Future Program Council Implementation Subcommittee, which is working to achieve a balance between JPL's workload and the resources available to get it done.

*How do you assure people that if they bring an issue forward to you that they will not be risking their job, their good standing, their reputation?*

That's a good question. The Laboratory has a policy against retaliation, and I make that clear from the beginning. Also, if the employee is really concerned about termination, and if they feel comfortable discussing it, I refer them to Employee Relations, which owns that process.

I do try to get employees back to their supervisor, assuming the supervisor is not a player in the situation. This way, the supervisor won't be upset that the employee appears to have gone around the supervisor to settle the issue, and won't wonder why the employee

didn't talk to them first. In fact, some supervisors will resent the fact that employees didn't come to them for help. I want to get them out of a possible political problem. And I won't meet with the supervisor unless the employee says it's OK. But again, most employees want to solve it on their own. Other options include talking to Ethics or the Employee Assistance Program.

*Are you always able to hear all sides of an issue?*

I try to get employees to tell me whether or not they are the only one who knows about or is affected by their issue or concern. I have an obligation to try to hear as many sides of an issue as possible. However, employees often will not allow me to hear another side of an issue, and that can tie my hands. Sometimes I will have only the employee's story. And I will tell them that since I don't know the other side, while I can still provide advice and counsel, it will not be quite the same because there may be some missing pieces and what is missing may be exactly what is needed to help shape a solution to the specific situation.

*How do you deal with issues that—from your observations—are prevalent and widespread on Lab? How do you spread the word on institutional issues that may come to your office?*

I tend not to hear good stuff, so I have to be careful when I start extrapolating things for the whole Laboratory. But on a semi-monthly basis I prepare a written document that goes to Larry Dumas, the deputy director, which he shares with the Executive Council. It basically shows my understanding of generic issues that I'm hearing from employees. No names or any kind of identifying information is attached.

*How many people are you seeing?*

I only keep track of the number of people who see me if it is for an hour or more, and that's about 150 per year. I know of organizations larger than JPL where the ombudsperson is seeing no more employees than I am. But my gut tells me that for a population this size, perhaps I should be seeing more people.

*How does someone reach you?*

I can be reached on Lab at ext. 4-7045, or (800) 565-5058. The fax number is 3-3960. □

## SESPD

Continued from page 3

for implementation and operations will incorporate the Design, Build and Test (DBAT) and Verify, Integrate, Validate and Operate (VIVO) processes.

With the inclusion of Mars missions, SESPD currently oversees 54 projects or pre-projects (flight missions and instruments), with 43 of them in the implementation/operations phase.

A new SESPD organization chart is available online at [http://eis.jpl.nasa.gov/~chawley/pdf/7xorg\\_04.pdf](http://eis.jpl.nasa.gov/~chawley/pdf/7xorg_04.pdf). □

## Feedback

Continued from page 4

important to them."

One-hour information forums for the Upward Feedback process will be held July 1, 9 a.m. in the Building 167 conference room; July 8, 9 a.m. in Building 180-101; July 15, 1 p.m. in Building 180-101; and July 21, 10 a.m. in the Building 167 conference room.

For more information, go online to <http://hr/feedback>. □

## LETTERS

I would like to thank my friends, colleagues and co-workers on the Voyager and Ulysses Projects for the beautiful flower arrangement, their support, and expressions of sympathy after the recent passing of my father. Thank you all for your thoughtfulness.

Bill Mogensen

## FOR SALE

BABY ITEMS, Graco portable bassinet/playpen, \$35; crib tent, \$40; baby monitor, \$8, Baby Bjorn carrier, \$30; Graco swing w/bassinet, \$40; crib rocker, \$10. 323/342-0607.

BEDS, 2 toddler white assembled, metal frame, durable plastic head and side rails, great condition, used only 10 mos., mattresses are included (crib size), \$75/ea. 626/303-5595.

CHINA SET, 60 pieces for \$70/obo. 909/592-0780, Ana. COMPUTER, Mac II FX, Conner 140 MB HD, 780 kb 3.5" FD, 1.4 MB 3.5" FD, 20 MB RAM, System 7.5.3, 32-bit addressing, 14" color monitor (16 colors), Global Village Teleport 33.6 fax/modem, Netscape Communicator, \$150, 541-0062.

CROCK POT square by Rival with Corningware, \$13/obo. 626/568-8298.

DINING ROOM FURNITURE: cherry wood server from Ethan Allen (Georgian Court Collection), dimensions 40" x 21" x 34", exc. condition, \$850/obo; unrelated 5-piece dinette set (table dimensions 48" x 36" x 29"), \$75. 626/577-8107.

DINING ROOM SET, Henredon 74" x 46" pedestal table w/20 22" leaves, 6 chairs, custom table pads, vg cond., \$895. 626/798-2531.

DINING TABLE, black smoked glass with 6 matching chairs, \$150/obo. 661/945-8638 (Lancaster).

DRESSER/CHANGER for baby, white, \$50; baby car seat/carriger \$25; high chair \$50; misc. baby items & toys at reasonable

prices; BREAKFAST TABLE & 4 chairs, \$150; SECTIONAL COUCH, beige, almost new, \$350; COMPUTER DESK & CHAIR, \$100. 248-8853.

EXERCISE EQUIPMENT: electronic treadmill, variable speed & incline, heart rate monitor, \$50; stair stepper, \$25; swing-walker, \$25; all in great condition, you haul, Valencia area. 661/297-0219.

EXERCISE EQUIPMENT, Tunturi stationary bike, gd. cond., \$25. 352-5437.

FOOTBALL PICTURE, Randy Moss ('98 rookie of year) autographed 8 x 10 w/certificate of authenticity, \$75; BASEBALL & FOOTBALL CARDS, unopened boxes, '92-'99, \$30-\$100; BEANIE BABIES, McDonald's, all 12 in original bags. 626/914-6083.

GARAGE SALE, 4723 Alminar Ave., La Canada; lots of draftsman and elect test equip., power tools, furniture, mattresses,

Continued on page 8

washer, dryer, stove, organ, exercise equip., much more; Sat. and Sun. 952-1538.

MODEM, Apple Geoport adapter fax/modem, model M1694 express for power Mac, \$25. 541-0062.

MONITOR, Magnavox 14" color for Macintosh, great resolution/contrast, yrs. left, \$45. 626/441-8572.

MOVING SALE: TV, dresses, baby items, books, clothes, kitchen, desk, plants, microwave, etc. 626/799-6196.

OVEN, gas, Whirlpool, electronic timers, etc., pd. \$600; sell \$400/obo. 541-0131, Gary or Sue.

PALM PILOT professional PDA, 512KB memory, \$75. 626/796-5216.

PHOTOGRAPHS, 40" x 30", color, framed; 2 tall-ship pictures by a professional photog., vg cond., 1 of a Spanish ship in the SF bay, one of a German ship near Puerto Rico, \$70/each, \$120/both obo. 626/568-8298.

PICTURE FRAMES, 3 made of brass, 22" x 28"; \$6 each, \$15 for all 3/obo. 626/568-8296.

PRINTER, color, Lexmark 1100 w/orig. ink cartridge over half full, \$75. 626/797-3156.

PRINTER, Xerox Diablo 630 daisywheel with print wheels/ribbons, exc. cond., works great, \$10/obo. 626/568-8298.

REFRIGERATOR, Kenmore, 19.9 cu. ft., almond, like new. 249-4646.

SOFTWARE, Snappy video capture system, never used (\$39), Publisher 98 (\$39), unopened Word 97 (\$12), Eudora 4.0 (\$9), Adobe photo delux (\$9), Photo Studio (\$9), Bruderbund multimedia application bible CD (\$15), draw print studio (3 premier edition CDs with 33k clip art \$19); HOSE SPRINKLER & TIMER, metal oscillating (\$5 each). 366-6134.

STEREO CABINET, wood, nice finish, roughly 4.5' x 2.25' x 2' on casters with 2 add'l black shelves and a smoked glass door, solid, \$35/obo. 626/441-8572.

STEREO EQUIPMENT: Infinity speakers, exc. condition, \$25 ea.; Radio Shack speakers, good condition, \$15 ea. 352-5437.

STOVE/OVEN, antique, O'Keefe & Merritt, 4 burner, grill, 2-door oven, broiler, grillovator, 3 drip trays and storage area, GC, \$400/obo. 626/303-5595.

STOVES: Caloric, gas, dark brown, self-clean, 13 yrs. old, stored last 6 yrs., \$65; Amana, electric coil, almond, 2 yrs. old, \$50; HOOD, almond, \$25; SINK, Kohler, 2 drains, almond, 3 yrs. old, \$70; FAUCET, Price-Pfister, integral spray, almond, 3 yrs. old, \$25; can deliver; best offer. 661/286-1038.

TABLES, glass, four 2-shelf tables with brass feet, three make up a coffee table (one round 2.5 ft. dia., two "half-moon"); fourth is a round end table, 2.5 ft. dia.; \$125/obo. 909/592-0780, Ana.

TELEVISION, RCA ColorTrak, 25" screen, attractive cabinet, rotates on base, overall dimensions 34" x 19" x 30", good condition, \$40; indoor TV antenna (rabbit ears), rotating type, RCA, vg condition, \$10. 626/577-8107.

TELEVISION, Sony 19-in color, with remote, great picture, works fine, \$150/obo. 626/963-2565.

TENNIS RACKET, Prince Magnesium Pro, never been used, w/cover, \$30. 626/441-8572.

## NOTICE TO ADVERTISERS

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## Universe

### Editor

Mark Whalen

### Photos

JPL Photo Lab

Universe is published every other Friday by the Public Affairs Office of the Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109.

*Advertising is a free service offered only to JPL, Caltech and contractor employees, retirees and immediate families.*

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Ads are due at 2 p.m. on the Monday after publication for the following issue.

To change an address, contact your section's administrative assistant, who can make the change through the HRS database. For JPL retirees and others, call Xerox Business Services at (626) 844-4102.

WATER FILTERS (replacement), Pur Ultimate, 2, brand new in sealed package, \$10 each. 626/573-2564, nites, Mary.

WATERBED, Super Single daybed style, black leather, 6-drawer pedestal, \$200. 661/946-2616.

WEDDING DRESS, exc. cond, used once, in garment bag, white, straight, long sleeves, bow in back, \$40/obo. 626/568-8298.

WEDDING DRESSES, size 10, lots of pearls/ lace/long train, \$300/obo; size 14, with removable train, \$200/obo. 661/945-8638 (Lancaster).

## VEHICLES / ACCESSORIES

'70 ARISTOCRAT travel trailer, 16', sleeps 5, good cond., \$950. 626/305-1061.

'92 BUICK LeSabre, loaded, leather interior, \$5,500/obo. 248-1856, Gordon.

'86 CHEVY Suburban, ¾-ton 454 V8, two package, AT, front & rear a/c, all power, 3rd seat, limited slip differential, alloy wheels, HD trailer hitch, roof rack, vg cond., all maint. records, \$6,000. 247-0831.

'84 CHEVY Silverado ¾ ton pickup, AT, PW, a/c, Sony, clean, runs good, \$4,200. 957-8463.

'97 FORD Mustang GT, 4.6L SOHC V8, 5 spd., 17" alloy wheels, ABS, a/c, cruise control, AM/FM cass. stereo, pwr. windows, pwr. door/trunk lock, alarm, fog lamps, custom car cover, cargo net, 12K miles, \$18,975/obo. 626/796-5216.

'85 FORD Ranger, 160K mi., runs well but needs TLC, \$650/obo. 626/799-6196.

'87 HONDA Civic Si, hatchback version of CRX Si, 5 sp., red w/ black interior, 199,000 miles, 1.5L-FI, a/c, am/fm cassette, Honda alloy wheels, 48+ mpg highway, great car, \$2,000. 661/299-2490 or e-mail: perodi@aol.com.

'98 LEXUS ES 300, auto, 5,000 mi., loaded, moonroof, CD, leather seats, salvage title, \$22,750/obo. 909/599-3230.

'64 LINCOLN Continental, suicide doors, new interior, 110K orig. miles, perfect paint, runs & looks great, \$5,500/obo. 246-6689.

'96 MERCURY Villager GS mini-van, 53K original miles, exc. cond., green w/grey int., 4 Michelin tires (7 mo. new), dual a/c, 4-wheel ABS, alum. wheels, pwr. everything, keyless entry, cruise, premium sound, privacy glass, very well maintained, \$14,000. 626/574-2013.

'97 NISSAN Altima GXE, auto, 23,000 mi., pwr. door locks/windows/antenna, cruise cont., am/fm/stereo, a/c, exc. cond., \$10,800/obo. 909/599-3230.

'95 NISSAN Maxima, dark blue, dark gray interior, 55K miles, sun roof, 24-valve 6 cyl., factory alloys, all records, oil change every 3,500, recent tires & brakes, very nice, \$10,000. 626/798-4740.

'87 NISSAN Maxima GXE, all power, moonroof, loaded, 110,000 mi., exc. cond., 1 owner, \$3,500/obo. 909/599-3230.

RIMS/TIRES, 16" TSW Stealth rims w/205-40 R-16 tires; will fit Mazda MX6, Toyota Supra, Toyota truck, Mitsubishi Eclipse, etc., \$400/obo. 246-6689.

'91 SAAB 9000 Turbo hatch, 88K miles, clean inside and out, automatic, dual SRS, black exterior w/ tan leather interior, power windows/locks/steering, alarm, premium wheels (\$400 rims), dual heated and power seats w/memory, abs (4-wheel), cruise ctrl, a/c, am/fm cassette, equalizer, sunroof, \$8,000/obo. 626/744-9412.

'97 TOYOTA Camry LE, 15K mi., 4-cyl. auto, 4-dr., white w/tan leather int., pwr. steering/locks, alum. wheels, a/c, am/fm cass., \$17,000/obo. 249-2432, Amy.

'91 TOYOTA Camry sedan, 2.0L, 4 door, auto, 88K, a/c, am/fm/cd, new brakes, ps/pb, alarm, crse.ctl., exc. 2nd car, exc. cond., \$6,000/obo. 909/624-3181, Jay.

'90 TOYOTA 4Runner, body and engine in perfect condition, recently completed rework of engine, auto, 4-wheel drive, black with silver streaks, power locks/windows/steering, pwr. moonroof, front and rear grills, roof rack, running boards, 131K miles, \$10,000/obo. 626/797-8898, eves.

'86 TOYOTA Corolla, a/c, stereo/cass., 162k miles, w/car cover, good cond., only two owners, must sell, \$1,600. 626/577-5471.

'95 VW Jetta 4-door sedan, immaculate, very clean, 5 sp., a/c, p/s, sunroof, CD changer w/8 spkrs., alarm, performance with great fuel econ., \$8,500. 951-3566.

'93 VW Corrado SLC, VR6, classic green/beige leather, rare AT, ABS, sunroof, a/c, alloy wheels, premium sound am/fm/tape, all options, new tires, original owner, exc. cond., \$14,500. 247-0831.

## WANTED

DANCE SHOES, boys, tap and ballet, size 5 to 7. 626/797-6824.s

LEGO BLOCKS for my 6-year-old grandson. 626/797-6490, Kermit Pederson.

PARKING for venerable WWII ambulance, will be used for retirement trips. 626/401-2571.

STAINED GLASS supplies, cutters, pliers, etc. 248-4254.

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman.

VANPOOL RIDERS, forming a new pool from Northridge/Granada Hills/Mission Hills: JPL employee vanpools receive \$50/month supplement. Ext. 4-0307, Marilyn.

VOLLEYBALL PLAYERS, all levels of play, every Tuesday night 8-10 at Eagle Rock High School, \$4/night. 956-1744, Barbara.

## FOR RENT

ALTADENA, furn. room w/cable TV; share 3-bd. quiet hilltop house; pool, view, 5 patios; all amenities incl. laundry, kitchen,

etc.; 11 min./JPL; smoking OK; should like classical music; \$500 (incl. util.) + deposit. 626/794-1050, after 7 p.m., Harry.

ALTADENA house to share with 1 other, 2 miles/JPL, 3 bd., 2 ba., w/garage, washer/dryer, extra phone line and network connection, \$600 + shared util. 626/791-2212, lv. message for Carlos.

GLENDAL, darling, large 1-bd. apt. with small bonus rm., newly re-decorated, wall-to-wall carpets, air conditioning, dishwasher, \$650 incl. water, gas and basic cable. 241-9448.

MONROVIA condo, share furnished 2 bd., 1.5 ba., full privileges, kitchen, laundry, central heat/ac, close to shops and street fair, no utilities paid, \$375 + security deposit. 626/357-5189.

PASADENA, room in 3-bd. apt. to share with two others; pool, parking, a/c, washer/dryer; \$460 + 1/3 utilities. 626/564-1078.

SYLMAR townhouse/condo, centrally located, 2 bd., 2 ½ ba., 2-car garage, central air/heat, stove/ dishwasher/fireplace, 20 min./JPL, freeway access, \$875 + security (JPLer discount). 626/797-9262.

## REAL ESTATE

BIG BEAR, new cabin 2 blocks from lake, 2 bd., 2 ba., mud/laundry room, \$129,000. 909/585-9026.

PASADENA, 3-bd., 2-ba. home in Lower Hastings; move-in cond., new roof, new copper plumbing, hardwood floors, cent. air/heat, upgraded kitchen, new paint in/out, lg. fenced yd. in rear, \$345,000. 626/446-1140.

PASADENA townhome, built in 1998, near Rose Bowl, 3.5 miles/JPL in gated community; approx. 1,400 sq. ft, 3 bd., 2.5 ba., 2-car attached gar., alarm, ceiling fans w/lights in all bedrooms, covered balcony off master bd., wood floors everywhere, all Corian counters, large landscaped backyard w/automatic sprinkler system, palm trees; community pool, Jacuzzi, basketball court; \$275,000/obo. 626/568-8298.

SAN DIMAS, single family home built in '88, secluded Via Verde area, 4 bd., 3 ba., alarm, 3-car garage, marble floors, large landscaped backyard w/auto sprinkler syst., BBQ area, Spanish fountain, automatic wireless outdoor lighting, palm trees, covered patio, red brick pathways/walls; \$530,000. 626/568-8298.

## VACATION RENTALS

BIG BEAR, 7 mi./slopes; full kitch., f/p, 2 bd., 1 ba., sleeps 6; reasonable rates; 2-nt. min.; no smokers, no pets; exc. hiking, biking, fishing nearby. 909/585-9026, Pat & Mary Ann Carroll.

BIG BEAR cabin, quiet area near village, 2 bd., sleeps 8, completely furnished, F/P, TV/VCR, \$75/night. 249-8515.

BIG BEAR LAKEFRONT lux. townhome, 2 decks, tennis, pool/spa, nr. skiing, beaut. master bdrm. suite, sleeps 6. 949/786-6548.

CAMBRIA, ocean front house, exc. view, sleeps up to 4. 248-8853.

HAWAII, Kona, on 166 feet of ocean front on Keauhou Bay, private house and guest house comfortably sleep 6; 3 bd., 2 ba.; rustic, relaxing and beautiful; swimming, snorkeling, fishing, spectacular views, near restaurants, golf courses and other attractions; low-season rates began May 1. 626/584-9632.

HAWAII, Maui condo, NW coast, on beach w/ocean vw., 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microw., dishwasher, pool, priv. lanai, slps. 4, 4/15-12/14 rate: \$95/nite/2, 12/15-4/14 rate: \$110/nite/2, \$10/nite/add'l person. 949/348-8047.

LAKE TAHOE, North Shore, 2 bd., 2-1/2 ba., sleeps 6-7, private sandy beach, great location, all amenities, pool, walk to golf course, fishing 150 yards from front door, great hiking, kayaking, river rafting, bike trails, 2 miles/casinos, JPL discount. 626/355-3886, Rosemary or Ed.

MAMMOTH condo, studio + loft, 2 ba., fireplace w/ wood supplied, Jacuzzi, sauna, game rm., color cbl. TV/VCR, full kitchen w/microwave, terrace, view, amen. 714/870-1872.

MAMMOTH condo in Chamonix, 2 bd., 2 full ba., slps. 6, fully eqpd. elec. kitch., microw. & extras, frplc./wood, color TV, VCR, FM stereo, o/d Jacc., sauna; gm. rec. & Indry. rms., play & BBQ areas, conv. to hiking, shops, summer events; daily/weekly rates. 249-8524.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft; slps. 6-8; fully equip'd kitch. incl. microwave, D/W; cable TV, VCR, phone, balcony w/mtn. view, Jacc., sauna, streams, fishponds; close to Mammoth Creek; JPL discount. 626/798-9222 or 626/794-0455.

OCEANSIDE, on the sand, charming 1 bd. condo, panoramic view, walk to pier or harbor, pool, spa, game rm., sleeps 4. 949/786-6548.

PACIFIC GROVE house, 3 bd., 2 ba., fp, cable tv/vcr, stereo/CD, well-eqpd. kitch. w/microwave, beaut. furn., close to golf, beaches, 17 Mile Dr., Aquarium, Cannery Row; JPL discnt. 626/441-3265.

PALM SPRINGS condo, 1 bd., completely furn., pool, spa, tennis, cable TV, VCR, carpet/paint/furnishing new, weekends/weekly/monthly. 626/445-0884.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.

SAN FRANCISCO, Nob Hill honeymoon suite (for 2 only); full kitchen, maid, concierge; walk to Chinatown, Top of the Mark, Union Sq.; \$125/nite; \$750/wk.; reserve early. 626/797-3156.

SOUTH LAKE TAHOE KEYS waterfront home, 4 bd./3 ba. (1 bd. & liv. rm. upstairs, hcp. access fair), sleeps 12+, fireplaces, decks overlooking dock/ski lifts, gourmet kitch., bikes, 20' sail & paddle boats, 3 color TVs, VCR, stereo w/tape & disk, indoor & outdoor pools, hot tub & beach; 8 tennis courts. 10 min. to skiing, casinos, golf; 1 hr/wine country, \$1,095/week for high seas. [15 June to 15 Sept; 22 Nov. to 1 March]; \$495/week low seas., plus \$90 cleaning fee, 3-day min. 626/578-1503, Jim Douglas.